



Student Name:

Date:

Period:

Volcanic Eruptions Story Map

Link to Story Map:

<https://nasa.maps.arcgis.com/apps/MapSeries/index.html?appid=3ac5d35d5101407d9e390d83538dddcf>

Part A: Engage

A.1 Describe the impact you think the Raikoke eruption could have on the Earth spheres: Atmosphere, Biosphere, Cryosphere, Geosphere, and Hydrosphere. Use the graphic organizer provided and write in **blue ink**.

A.2 Describe the impact you think the Sarychev eruption could have on the Earth spheres: Atmosphere, Biosphere, Cryosphere, Geosphere, and Hydrosphere. Use the same graphic organizer from the previous question. Write your observations in **black ink** (or different color) for the new volcano.

A.3 What do you observe?

A.4 Why do you think this is happening?



Earth System Graphic Organizer





Part B: Explore

B.1 What patterns do you notice between locations of volcanoes and tectonic plates?

B.2 Which volcano is located closest to where you live?

B.3 What is the name of the volcano you chose and where is it located?

B.4 Which tectonic plate is this volcano on? Would you say it is close to a tectonic plate boundary?

B.5 What ideas do you have about how this happens?

B.6 How does the direction of the ash and aerosols change over time?

B.7 How does the space occupied by aerosols and ash change over time?



B.8 What variables do you think contribute to the release of sulfur dioxide from volcanoes?

B.9 What questions do you have about sulfur dioxide in the atmosphere that you would like to investigate?

B.10 Notice that the sulfur dioxide emissions changed direction after April 30th. What variables in the Earth System could explain this change in the event?

B.11 Based on the graph, what happened just hours before the May 3rd eruption at Kilauea?

B.12 Based on the data from previous months, was this event unusual? Why or why not?

B.13 What is the direction of winds near the equator? (East or West)

B.14 What is the direction of winds at mid-latitude ranges? (East or West)



B.15 How do you think this variable may impact the movement of ash or aerosols from volcanic eruptions?

B.16 Identify five different countries on the map that contain significant volcano hazard.

B.17 Based on earlier slides in this section, do you have any ideas about why these volcano hazards are distributed the way they are around the earth?

B.18 Describe three different ways in which volcanoes impact the human ecosystem.

B.19 Can you think of any potential impacts volcanoes could have on the human ecosystem that were not described in these case studies?

B.20 If the volcanoes in these case studies were to erupt again, how significant do you think the impacts would be to human ecosystems? When answering this question, refer to the population densities near these volcanoes on the map.



Part C: Explain

C.1 If you look at the world map and locate North America, what do you notice about the edges of the continent?

C.2 Now look at other continents on the world map. What do you notice about the other continents?

C.3 Looking at the world map, do you see any continents that you think South America would match up with like two jigsaw puzzle pieces? Explain your answer.

C.4 How do you think the continents might have been arranged when they were all one continent?

C.5 Why do volcanoes and earthquakes occur close to each other?

C.6 What do you think is the driving force behind the formation of volcanoes and earthquakes?

C.7 What do the dark lines represent?



C.8 What observations can you make about the plates from this map?

C.9 What observations can you make about the plates related to the continents?

C.10 What are the layers of the Earth?

C.11 What is convection?

C.12 How does convection drive tectonic plate movement?

C.13 What are the three different types of volcanoes?

C.14 How is volcanic ash different than smoke?



C.15 What makes ash so dangerous?

C.16 How might sulfate aerosols from volcanoes affect global climate?

C.17 How do aerosols affect human health?

C.18 How does ash threaten humans?

C.19 If ash can damage aircraft engines, what do you think it could do to human lungs?

C.20 How can ash advisories help the airline industry?

C.21 How can ash advisories help the general public?



Part D: Elaborate

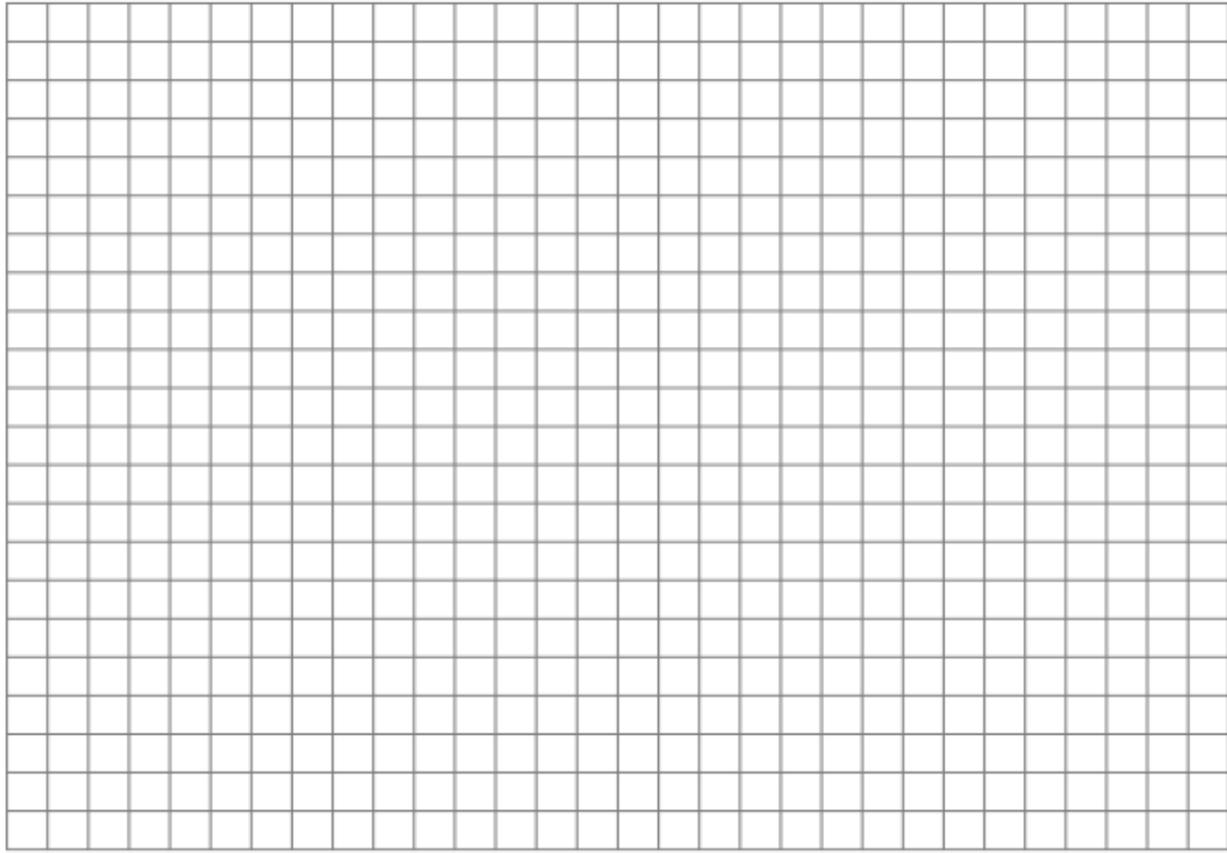
D.1 What is the trend in sulfur dioxide over the course of a year?

D.2 Was there any noticeable change?

D.3 What might have caused this?

D.4 Place the images in the correct sequence on your desk or table. Note how the images have changed over time.

D.5 On the graph paper on your worksheet, graph the maximum value for sulfur dioxide concentration near Hawaii each month for the year 2018.



D.6 When you are finished, discuss the results of your graph with nearby classmates.

D.7. Based on your graph, what was the trend in sulfur dioxide over the course of 2018?



Part E: Evaluate

E.1 Based on these data, describe an area on the map with high population density that you believe is at a greater risk of damage from ash from volcanoes than others.

E.2 How does volcanic hazard contribute to greater risk of damage in the area you picked?

E.3 How do wind patterns contribute to greater risk of damage in the area you picked?

E.4. How do you think people in this area could prepare for a volcanic eruption?

E.5. Fill in the chart with evidence and scientific reasoning that supports a claim for the impact aerosols and ash from volcanic eruptions will have on the human ecosystem. Refer to the Explain tab and examples of data provided in this lesson.



<p>State your claim: What effect do aerosols and ash from volcanic eruptions have on the human ecosystem?</p>	
<p>Provide Evidence: How does data provided in this lesson support your claim?</p>	
<p>Scientific Reasoning: What information from the Explain tab provides support for your claim?</p>	